

## 9. Chordates

- have a hollow dorsal nerve cord
  - a notochord - *turns into the backbone*
  - pharyngeal pouches - these become gills in fishes  
*↳ grow over if you have lungs*
  - a tail that extends beyond the anus
- ✗ some of these features are only present during development of the embryo and disappear over time

### 4 traits that characterize chordates

1. Notochord - long flexible rod of mesoderm found in all chordates; in verts is replaced by vertebrae of backbone

Dorsal, hollow nerve cord

2. ectodermal tissue that forms a spinal cord

Muscle segments

Notochord

Brain

Postanal tail

3. muscle & skeletal elements provide propulsive forces

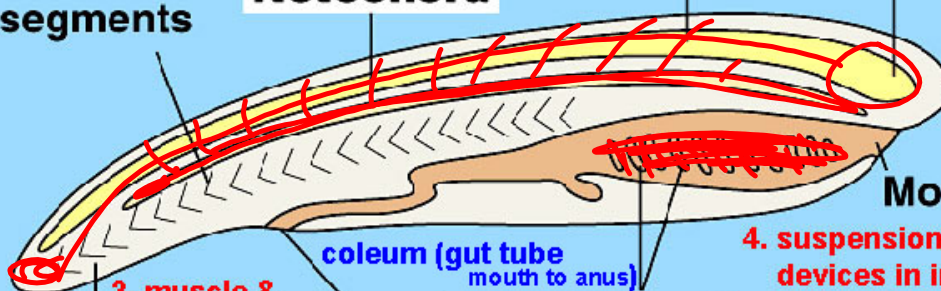
Anus

gut tube (mouth to anus)

Pharyngeal slits

Mouth

4. suspension feeding devices in inverts & gas exchange in aquatic verts & jaws + hearing in vertebrates



- there are 5 groups vertebrates: fish, amphibians, reptiles, birds, and mammals
- there are 2 groups of non vertebrate chordates: tunicates and lancelets..see page 769/770 in text



## Chordate Evolution

- been around for more than 500 million years

some of the changes that have occurred over time include: -

the development of jaws and paired appendages

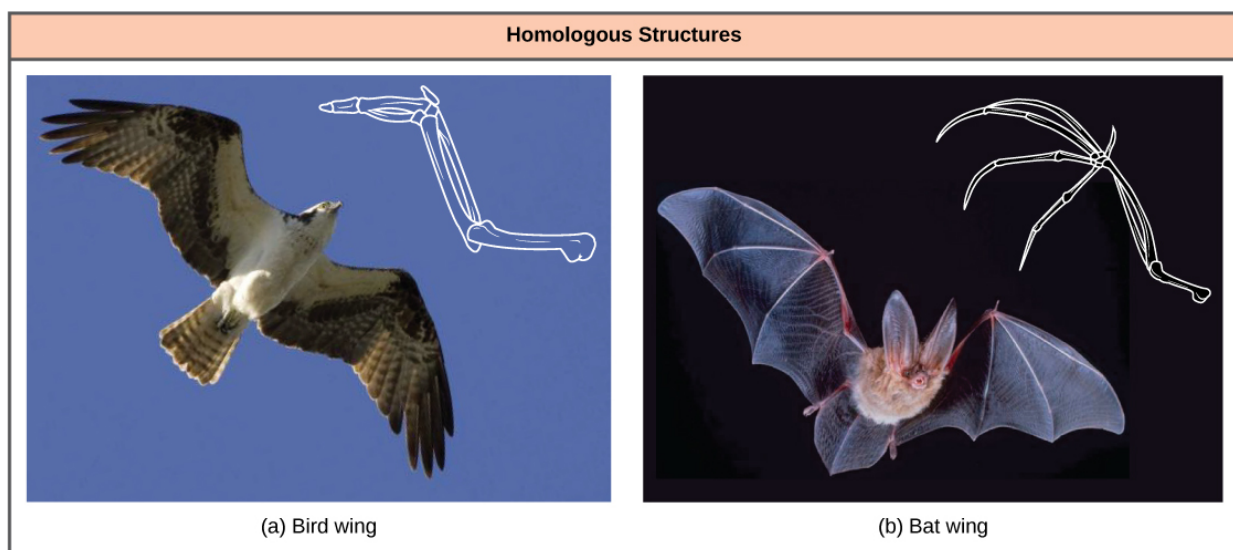
-the use of lungs

-having 4 limbs

-having an amniotic egg...has a shell/outer layer and membrane that allows it to develop out of water

- endothermy...warm-blooded (not necessarily a good thing as much energy is needed to maintain a constant temperature)

- these adaptations have created similar looking yet unrelated chordates such as a birds and bats which are mammals



- this was a result of these species encountering similar ecological condition as they evolved